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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,018	07/05/2001	Per Granstrand	032822-014	9288

7590

05/22/2003

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EXAMINER

FLORES RUIZ, DELMA R

ART UNIT PAPER NUMBER

2828

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

5

P-5

Office Action Summary

Application No.

09/898,018

Applicant(s)

GRANESTRAND ET AL.

Examiner

Delma R. Flores Ruiz

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 29-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Group II withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being for the nonelected design. Election was made without traverse in Paper No. 8.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 14 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 6 – 10, and 12 – 14, are rejected under 35 U.S.C. 103(a) as being unpatentable over Parayanthal (6,542,533) in view of applicant's admitted prior art as show in Fig. 1 and detailed in the specification.

Regarding claims 1, 13, Parayanthal disclose an optical device having a back facet (see Fig. 3, Character 11) and a front facet (see Fig. 3, Character 21) opposite to each other, said device including; a laser (see Fig. 3, Character 10) adapted to emit light essentially perpendicular to said back facet (see Fig. 3, Character 11) a modulator (see Fig. 3, Character 20) having an input end and an output end respectively, and adapter to receive and modulate light emitted from said laser and to output modulated light at said modulator output end; said modulator is bent such the modulated light output from said modulator is propagating essentially in a direction, which is angled with respect to the normal of said front facet. Parayanthal discloses the claimed invention except for window region. It would have been obvious at the time of applicant's invention, to combine applicant's of teaching a window region with optical device because the modulator is curved such that light emitted by laser along the axis and modulated by modulator during operation, is output into window region in a direction,

which from an angle with respect to the normal of the device front facet. An upper limit is the angle for total reflection, which depends on the refractive index of the window region, the AR coating and the surrounding air. The geometrical consideration; the light will enter the window region at essentially the angle relative to the Z axis and the light reflected at the front facet will, due to this angle, to a great extent be deflected away from the waveguide output end. This will suppress the reflection from the front facet.

Regarding claim 2 Parayanthal in view of the applicant's discloses the angle between the propagation direction of the light and the normal of said front facet is at least 2° , preferably at least 5° , more preferably at least 8° , and most preferably around 8° (Column 3, Line 28 – 38, and 53 – 61).

Regarding claim 7, Parayanthal in view of the applicant's disclose the front facet is provided an AR coating (see Fig. 3, Character 21, Column 1, Lines 55 – 68, Column 2, Lines 1 – 8, 63 – 68, and Column 3, Lines 62 – 68).

Regarding claim 8 and 9, Parayanthal in view of the applicant's disclose the device is monolithically integrated semiconductor laser and the laser is a DFB laser and the modulator is an EAM ((See Fig. 3, Abstract, Column 1, Lines 26 – 28, and 40).

Regarding claim 10, Parayanthal in view of the applicant's disclose the back facet is provided with a HR coating (Column 2, Lines 7, 68, and Column 3, Lines 20 – 24).

Regarding claim 12, Parayanthal in view of the applicant's disclose a front facet is angled with respect to said back facet (see Fig. 3).

Claims 3 – 6, 11 and 19 – 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parayanthal (6,542,533) in view of applicant's admitted prior art as show in Fig. 1 and detailed in the specification, further in view of Chen et al (6,137,619).

Regarding claim 3 – 6 and 21 – 23, Parayanthal in view of the applicant's discloses the modulation output end section is between 10 and 1000 microns long, and preferably 20 and 50 microns long (Column 1, Lines 65 – 68, Column 2, Lines 1 – 8). Parayanthal in view of the applicant's discloses the claimed invention except for modulator output end is tapered. It would have been obvious at the time of applicant's invention, to combine Chen of teaching a modulator is tapered with optical device because a consequence of the tapering if the waveguide the light field at the output of the tapered region will be transversally expanded. The combination of a bent

modulation and a tapered modulator output end is that less light will be present in the angular distribution at the output of the tapered modulator end at angles that would to a great extent be reflected back into the modulator waveguide.

Regarding claim 11, Parayanthal in view of the applicant's discloses the claimed invention except for the device is made of $\text{InP}/\text{In}_{1-x}\text{Ga}_x\text{As}_y\text{P}_{1-y}$. It would have been obvious at the time of applicant's invention, to combine applicant's of teaching a the device is made of $\text{InP}/\text{In}_{1-x}\text{Ga}_x\text{As}_y\text{P}_{1-y}$ with optical device because it would have been obvious to one having ordinary skill in the art at the time the invention was made to the device is made of $\text{InP}/\text{In}_{1-x}\text{Ga}_x\text{As}_y\text{P}_{1-y}$, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claim 19 and 26 Parayanthal in view of the applicant's further in view of Chen discloses an optical device having a back facet (see Fig. 3, Character 11) and a front facet (see Fig. 3, Character 21) opposite to each other, said device including; a laser (see Fig. 3, Character 10) adapted to emit light essentially perpendicular to said back facet (see Fig. 3, Character 11) a modulator (see Fig. 3, Character 20) having an input end and an output end respectively, and adapter to receive and modulate light emitted from said laser and to output modulated light at said modulator output end; said modulator is bent such the modulated light output from said modulator is propagating

essentially in a direction, which is angled with respect to the normal of said front facet; said device being further arranged such that modulated light output from said modulator is propagating essentially in a direction, which is angled with respect to the normal of said device front facet (see Fig. 3). Parayanthal discloses the claimed invention except for window region and modulator output is tapered. It would have been obvious at the time of applicant's invention, to combine applicant's of teaching a window region and modulator output is tapered with optical device because the modulator is curved such that light emitted by laser along the axis and modulated by modulator during operation, is output into window region in a direction, which from an angle with respect to the normal of the device front facet. An upper limit is the angle for total reflection, which depends on the refractive index of the window region, the AR coating and the surrounding air. The geometrical consideration; the light will enter the window region at essentially the angle relative to the Z axis and the light reflected at the front facet will, due to this angle, to a great extent be deflected away from the waveguide output end. This will suppress the reflection from the front facet. A consequence of the tapering of the waveguide the light field at the output of the tapered region will be transversally expanded. The combination of a bent modulation and a tapered modulator output end is that less light will be present in the angular distribution at the output of the tapered modulator end at angles that would to a great extent be reflected back into the modulator waveguide.

Regarding claim 20, Parayanthal in view of the applicant's further in view of Chen discloses the angle between the propagation direction of the light and the normal of said front facet is at least 2° , preferably at least 5° , more preferably at least 8° , and most preferably around 8° (Column 3, Line 28 – 38, and 53 – 61).

Regarding claim 24, Parayanthal in view of the applicant's further in view of Chen disclose the front facet is provided an AR coating (see Fig. 3, Character 21, Column 1, Lines 55 – 68, Column 2, Lines 1 – 8, 63 – 68, and Column 3, Lines 62 – 68).

Regarding claim 25, Parayanthal in view of the applicant's further in view of Chen disclose the device is monolithically integrated semiconductor laser (See Fig. 3, Abstract, Column 1, Lines 26 – 28, and 40).

Regarding claim 27 and 28, Parayanthal in view of the applicant's further in view of Chen disclose and a modulator is angled with respect to the normal of said front facet a front facet is angled with respect to said back facet (see Fig. 3).

Claims 14 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parayanthal (6,542,533) in view of applicant's admitted prior art as show in Fig. 1 and detailed in the specification, further in view of Ichikawa et al (4,070,681).

Regarding claim 14 – 18 Parayanthal (6,542,533) in view of applicant's discloses the claimed invention except for optical module comprising an out-coupling device arranged at an angle with respect to the normal of said optical device front facet, and the out-coupling device comprises a lens and or an optical isolator. It would have been obvious at the time of applicant's invention, to combine Ichikawa of teaching a optical module comprising an out-coupling device arranged at an angle with respect to the normal of said optical device front facet, and the out-coupling device comprises a lens and or an optical isolator with optical device because the laser beam from the modulator is bent in the vertical direction by a reflecting optical system and further bent in horizontal direction by a reflecting optical system or element so as to reach a beam expander system. Since the reflecting optical systems are movable in either the X or Y direction and their reflecting surfaces are rotateable, it is possible to cause the laser beam to enter the beam expander along the optical axis thereof by adjusting the positions of the reflecting systems independently of each other in whatever direction the beam may emerge from the modulator. The laser beam has its beam diameter enlarged by the beam expander while it remains a parallel beam. The laser beam with its diameter so enlarged is caused to impinge upon a scanning means such as a

polygonal rotateable mirror having one or more mirror surfaces. The polygonal rotateable mirror is mounted on a shaft supported by a high precision bearing and may be driven from a constant speed motor 11. (such as a hysteretic synchronous motor or DC servomotor). The scanning means, however, is not restricted to the polygonal rotateable mirror or the like. As the laser beam emerges from the beam expander, it is horizontally swept by the polygonal rotateable mirror. The laser beam deflected by the polygonal rotateable mirror is imaged as a spot on the photosensitive drum by an image-forming lens.

Conclusion

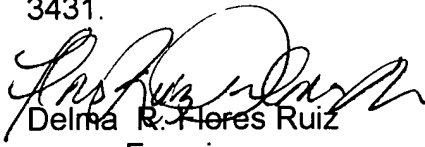
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-

3431.



Delma R. Flores Ruiz
Examiner
Art Unit 2828



Paul Ip
Supervisor Patent Examiner
Art Unit 2828

DRFR/PI
May 13, 2003